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A NEW CESTODE FROM LIPARIS LIPARIS*

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The name *Spathebothrium simplex* gen. et sp. nov. is proposed for a cestode collected at Woods Hole, Mass., by the late Vinal N. Edwards from the sea snail, *Liparis liparis*.

Mr. Edwards's record is as follows:

March 25, 1904, 2 fish examined, stomachs filled with small sand fleas, 2 tape worms in intestine of one.

April 14, 1904, 15 fish examined, stomachs filled with sand fleas; full of spawn, nearly ripe; 7 tape worms from 4 fish.

January 14, 1905, 2 fish examined, one tape worm in each.

The cestodes in these three lots belong to the same species. Their lengths, in alcohol, were 12, 14, 15, 16, 18, 18, 20, 20, 21, 26 and 33 millimeters respectively. The maximum breadth was about 2.25 millimeters; ova 0.036 by 0.021 mm. in the two principal diameters.

The strobile is flattened, nearly linear, bluntly and smoothly rounded at the two extremities. About the only difference noted between the anterior and posterior ends, as seen in whole mounts, is that genitalia are wanting for a short distance at the anterior end while the vitellaria continue to the extreme tip of the posterior end. In a specimen 11 mm. in length the first cirrus is 0.44 mm. from the anterior end. The scolex therefore is represented by the short portion which precedes the genitalia and is probably transparent in life. In this specimen the vitellaria began a little posterior to the level of the cirrus.

The strobile is not divided into distinct proglottides, the only indication of strobilation being the successive sets of genital apertures, and, in cleared and mounted specimens, the ovaries which are conspicuous, lobed, and lie between the genital apertures at what would be the posterior end of a proglottis, if proglottides were present.

The reproductive apertures are situated along the median line and are not restricted to one of the flat surfaces of the strobile. For example, in a specimen which had 20 sets of reproductive organs twelve of these opened on one of the flat surfaces of the strobile and eight on the other. In another specimen sixteen were counted on one side and nine on the other. In a specimen 16 mm. in length the distance between adjacent sets of reproductive pores was about 0.67 mm., the first set lying about the same distance from the anterior end. The apertures of the cirrus, vagina and uterus are

*Contribution from the U. S. Biological Station, Woods Hole, Mass., and the Zoological Laboratory of the University of Missouri.

near together, that of the cirrus being a little anterior to those of the uterus and vagina, which are very near together and about at the same level.

The vitellaria continue without interruption from near the anterior end to the posterior end, so that the strobile superficially resembles an elongated trematode. The testes lie for the most part in front of the ovary and are medially placed with respect to the vitellaria. In transverse sections through regions where the uterus is filled with ova the testes are lateral and near the vitellaria (Fig. 6). The cirrus pouch is short but with relatively thick muscular walls. The vagina has a strong muscular sphincter near its external opening (Figures 2, 4, 5). In ripe strobiles each set of reproductive apertures is preceded by a mass of ova.

The musculature, so far as it is shown in sections, is poorly developed. A few longitudinal fibers were noted in the subcuticula, but no trace of a layer of longitudinal fibers between the subcuticula and central parenchyma was seen, nor was there any indication of a circular layer. The cuticle (Fig. 3) consists of two layers, an outer made up of short rod-like structures, and an inner structureless layer. The outer layer constitutes about two-thirds of the thickness of the cuticle but it may be more or less abraded. The subcuticula in my sections appears as a loose mesh of fine fibers with scattering cells. The thickness of the cuticle in the section from which figure 3 was sketched was 0.01 mm., of the subcuticula 0.07, and of the smaller diameter of the section, representing the thickness of the strobile, 0.5.

Sections of the anterior end of a strobile show numerous anastomosing vessels of the excretory system. These vessels were difficult to interpret in transverse sections in regions of the strobile where the reproductive organs had appeared. Nowhere were they satisfactorily seen to be definitely established as dorsal and ventral lateral vessel. In cases where two principal lateral vessels could be distinguished they lay in about the same horizontal plane with reference to the axis of the strobile. From a study of a series of sagittal sections the lateral vessels were interpreted to be two, with thin walls, somewhat tortuous, and giving off transverse branches.

This cestode is peculiar in the absence of bothria, and in certain characteristics of the genital pores. The three genital apertures, cirrus, uterus, and vagina, are, as a rule, near together on the median line, and irregularly alternate with respect to the so-called dorsal and ventral surfaces of the strobile. This feature stands in the way of referring it to the *Pseudophyllidae*, which group is characterized by having the opening of the uterus always on one of the faces, although the openings of the cirrus and vagina may stand on opposite faces, or on a lateral margin.

It is thus seen that the species with which we are dealing is unique in that it is not possible to speak of a dorsal and ventral surface of the strobile. For it will be observed that, not only are the reproductive apertures irregularly alternate on the flat surfaces of the strobile, but the reproductive organs themselves are also irregularly alternate with respect to those surfaces (Fig. 2).

While examining a large number of transverse sections a single exceptional disposition of the reproductive apertures was noted. Figures 7 and 8 are sketches of this exceptional condition. Here the aperture of the cirrus is seen to be on one of the flat surfaces of the strobile while the openings of the vagina and uterus are on the opposite side. Since the apertures of the uterus and vagina do not lie in the same horizontal plane it was necessary to make two sketches. In the series of sections in which this anomalous condition was noted two sections intervened between the sections shown in figures 7 and 8.

An interesting feature with respect to the relative position of ovary and vaginal aperture is shown in figure 2. In the upper part of the figure the ovary is seen to be on the opposite side of the strobile from the vaginal aperture, in the lower part of the figure it is on the same side. In the former case the vagina crosses from one side of the strobile to the other, in the latter it turns abruptly posteriad near the aperture.

Synopsis of genus *Spathebothrium*

No distinct scolex; strobile taenaeiform, bluntly rounded at the extremities, proglottides not distinct, reproductive apertures on median line and irregularly alternate.

EXPLANATION OF PLATE

<i>c.</i> cirrus	<i>sr.</i> seminal receptacle
<i>cp.</i> cirrus pouch	<i>t.</i> testes
<i>cu.</i> cuticle	<i>u.</i> uterus
<i>m.</i> sphincter muscle of vagina	<i>v.</i> vagina
<i>o.</i> ovary	<i>vd.</i> vas deferens
<i>sc.</i> subcuticula	<i>vg.</i> vitelline glands.
<i>sg.</i> shell gland	

Fig. 1. Sketch of specimen mounted in balsam, somewhat diagrammatic. In this specimen there were 12 sets of reproductive apertures on one side and 8 on the other. Length 16 mm.

Fig. 2. Sagittal section near median line showing reproductive apertures on opposite sides of the strobile. The succeeding section to this in the series shows the uterus in about the same relative position as that of the vagina in the lower left of the sketch. Thickness of strobile at this point 0.30 mm.

Fig. 3. Cuticle and subcuticula highly magnified. Thickness of cuticle 0.01 mm.

Fig. 4. Reproductive apertures as seen in horizontal section. Sketch made from section showing first appearance of the uterus. The vagina had appeared first in the preceding section, and the cirrus in the sixth preceding section. Diameter of cirrus bulb 0.24 mm.

Fig. 5. External apertures of vagina and uterus, transverse section. Long diameter of ovum 0.035 mm.

Fig. 6. Transverse section showing uterus with ova, etc. Breadth of strobile at this point. 1.5 mm.

Fig. 7. Transverse section showing exceptional arrangement of genital pores, the cirrus opening on one side and the vagina on the other. Longer diameter of section 0.98 mm.

Fig. 8. From same series of sections as Fig. 7, two sections intervening between 7 and 8. The cirrus bulb still shows and the vagina is replaced by the uterus.

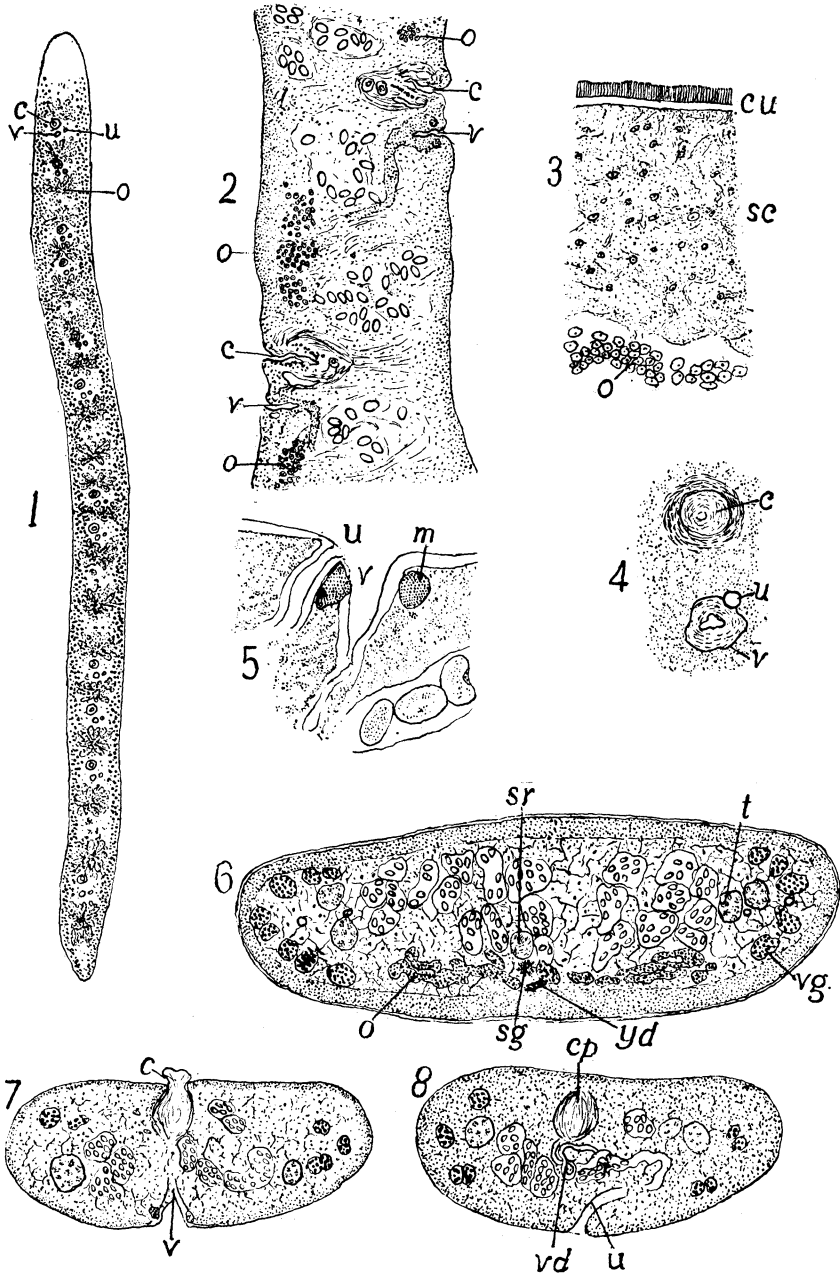


PLATE XV